

# A New Species of *Calloplax*

(Mollusca : Polyplacophora)

## in the Eastern Pacific

BY

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(1 Plate; 3 Text figures)

IN A RECENT REVIEW of the genus *Calloplax* THIELE, 1909, in the Americas (FERREIRA, 1978), three species were recognized, *C. janeirensis* (Gray, 1828) in the tropical Caribbean, *C. vivipara* (Plate, 1899) in the warm-temperate region of Chile, and *C. duncana* (Dall, 1919) in the Galápagos Islands. Based upon material in the repositories of the California Academy of Sciences (CAS), Los Angeles County Museum of Natural History (LACM), Allan Hancock Foundation (AHF) [at LACM], and in the private collection of Col. George A. Hanselman, San Diego, California, an additional species of *Calloplax* in the tropical eastern Pacific is here described.

Polyplacophora Gray, 1821

Neoloricata Bergenhayn, 1955

ISCHNOCHITONINA Bergenhayn, 1930

CHAETOPLEURIDAE Plate, 1899

**Family diagnosis:** Tegmental sculpture strongly defined with rows of pustules or nodules often coalesced in riblets radially disposed on end valves and lateral areas of intermediate valves, longitudinally on central areas. Insertion plates with sharp teeth; intermediate valves uni-slit. Eaves solid. Girdle covered with minute, simple scales, sometimes polymorphic, often with glassy spicules or hairy processes interspersed or both. Radula median tooth wide, subquadrangular; major lateral teeth tricuspid or bicuspid.

*Calloplax* Thiele, 1909

**Generic diagnosis:** Elongate in shape (length/width ratio

ca. 2/1). End valves and lateral areas of intermediate valves with strong radial ribs or rows of pustules; central areas with longitudinal, often granose riblets. Mucro elevated, central or slightly anterior with convex, steeply sloping postmucro. Girdle with spicules (not hairs) interspersed amidst small, ovoid, close packed, coarsely-striated scales.

**Type species:** *Chiton janeirensis* Gray, 1828, by M.

*Calloplax hanselmani* Ferreira, spec. nov.

(Figures 1 to 3, 7, 8, 4 to 6)

*Chaetopleura* cf. *C. mixta* (Dall, 1919) (SMITH & FERREIRA, 1977: 85-86; figs. 6, 7).

**Diagnosis:** Small size chitons, dark greenish. Tegmentum with relatively large pustules arranged in radial rows on end-valves and lateral areas. On central areas, longitudinal rows of smaller pustules converging forward. Mucro central or slightly anterior; postmucro area convex. Girdle with polymorphic, mostly ovoid, small, coarsely striated scales and interspersed glassy spicules; girdle bridges empty.

**Type Material:** Holotype (CAS 017703); Paratypes (CAS 017705; CAS 017706; CAS 017707; CAS 006140).

**Type Locality:** Academy Bay, Isla Santa Cruz, Galápagos Islands, Ecuador (0° 43' S; 90° 20' W).

**Description:** Holotype (Figures 1, 2, 3)—Subcarinate; elongate, 6.0mm long, 3.5mm wide (including girdle). Color dark grayish green. Tegmentum pustulose; larger pustules (100-130µm in diameter, up to 150µm in height) disposed in radial rows on anterior valve (about 16 rows), lateral areas of intermediate valves (3-4 rows), and postmucro area of posterior valve (about 10 rows); smaller pustules (about 70µm in diameter, up to 50µm in height) aligned in forward-converging longitudinal rows on central areas

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(about 10 rows per side). Jugum smooth except for some few, low profiled, almost obsolete pustules. Lateral areas markedly elevated, particularly on anterior valves. Posterior edge of valves straight, not beaked. Width of valve i, 2.3mm; of valve viii, 2.2mm. Mucro central, inconspicuous; postmucro area moderately convex. Articulamentum greenish white. Insertion teeth well defined, relatively sharp; slit formula, 8-1-10. Sutural laminae subquadrangular, particularly on valves iii-vii, semi-ovate on valve viii. Sinus well defined. On valve viii, width of sinus 0.3 mm, width of sutural laminae 1.0mm, ratio (relative width of sinus) 0.30. Eaves solid.

Girdle's upper surface paved with small (about  $40 \times 20 \mu\text{m}$ ), ovoid scales, coarsely striated toward pointed end (Figure 4) and few glassy spicules up to  $300 \mu\text{m}$  long inter-

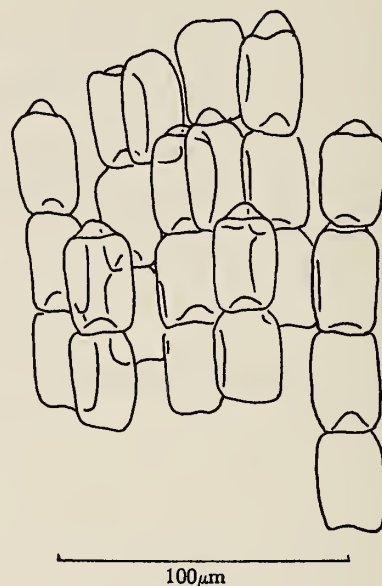


Figure 5

*Calloplax hanselmani* Ferreira, spec. nov. **Holotype.** Ventral girdle scales.

persed. Girdle bridges (Ferreira, in press) empty; i.e., devoid of spicules or other scale-like elements. Undersurface paved with rectangular, transparent scales, about  $400 \times 220 \mu\text{m}$ , bearing an outer edge protuberance that articulates with adjacent scale's inner edge concavity (Figure 5). Radula, 2.5mm long (42% of specimen's length) with some 35 rows of mature teeth; median tooth, broadly rectangular, about  $32 \mu\text{m}$  at anterior blade; major lateral teeth with tricuspid head (Figure 6).

**Paratypes:** Together with the holotype, ten other specimens of *Calloplax hanselmani*, here designated paratypes, were collected at Academy Bay, Isla Santa Cruz, Galápagos Islands, Ecuador, at four different stations in the intertidal zone by A. G. Smith and Jacqueline De Roy, in 1964-1967. The specimens display very little variation in color, sculpture, and tail valve characteristics, but the number of glassy spicules in the girdle is quite variable. Largest paratype, 9mm long. Slit formula of a paratype 6.4mm long, 8-1-10. A paratype, 6.7mm long (CAS 017707) is figured here (Figure 7); another, 7.3mm long (CAS 017706) was previously illustrated (SMITH & FERREIRA, 1977: figs. 6, 7).

#### Referred Material:

- 1) 3 specimens, largest 9.0mm long, Yacht Club beach, Mazatlán, Sinaloa, Mexico ( $23^{\circ}13' \text{N}$ ;  $106^{\circ}25' \text{W}$ ), leg. Howard & G. Sphon, 1st *Churea* Expedition, 20-23 Dec. 1961 (CAS 010112).
- 2) 3 specimens, dry, largest 8.2mm long, Punta Marinero, Mazatlán, Sinaloa, Mexico, leg. G. A. Hanselman, 9 Feb. 1971, intertidal (G. A. Hanselman Colln.) (Figure 8).

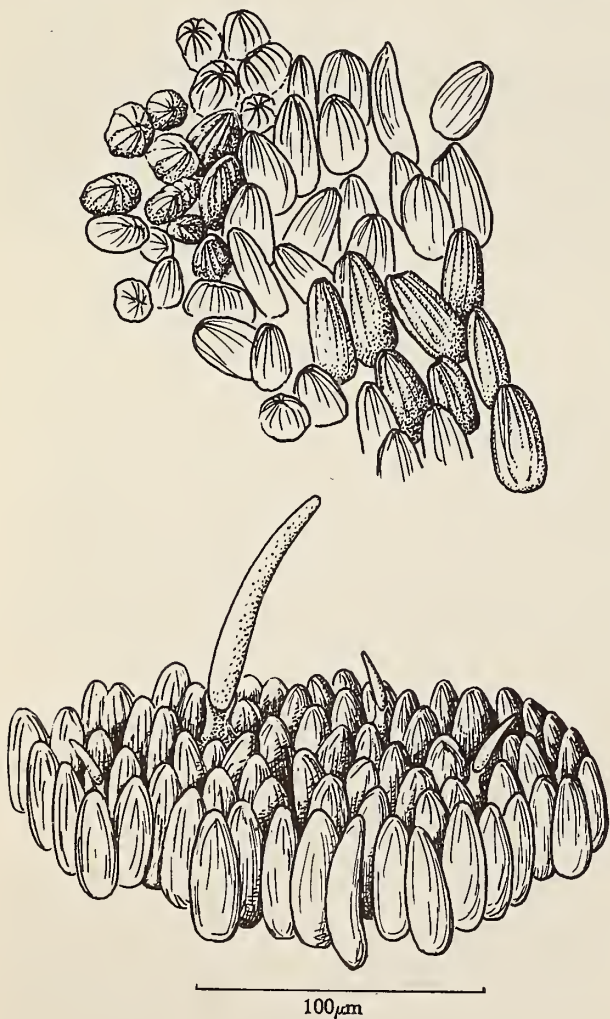


Figure 4

*Calloplax hanselmani* Ferreira, spec. nov. **Holotype.** Dorsal girdle scales and spicules.

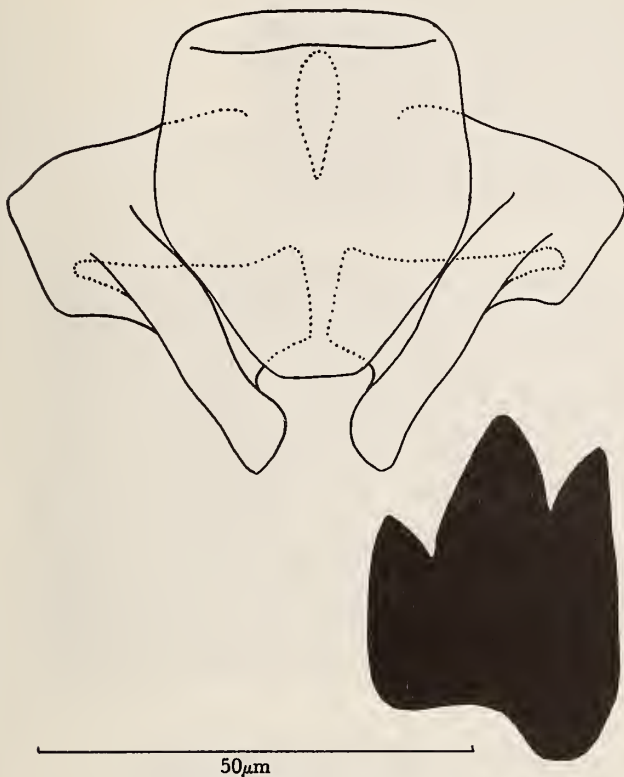


Figure 6

*Calloplax hanselmani* Ferreira, spec. nov. Holotype. Radula: Median tooth, first lateral teeth, and head of major lateral tooth.

- 3) 1 specimen, in alcohol, 6.6 mm long, North Beach, Mazatlán, Sinaloa, Mexico, leg. A. G. Smith, 9 Mar. 1945 (CAS 010114).
- 4) 2 specimens, dry, largest 8.8 mm long, Punta Piaxtla, Sinaloa, Mexico, leg. D. Shasky, 24 Dec. 1962, intertidal (CAS 025395).
- 5) 8 specimens, dry, largest 6.8 mm long (slit formula 8-1-9), Tangola-Tangola Bay, Oaxaca, Mexico (15°46'N; 96°06'W), leg. L. G. Hertlein, 16 Dec. 1931 (CAS 025396).
- 6) 1 specimen, 11 mm long, in alcohol, off Tumbes, between Caleta La Cruz and Punta Pizano, Tumbes Prov., Peru (3°28'S; 80°36'W) leg. J. H. McLean & D. Shasky, on shrimpboat *Maria Helena*, 13, 14 Apr. 1972 (LACM 72-83).
- 7) 1 specimen, in alcohol, 16.2 mm long, Sechura Bay, Peru (5°39'S; 81°01'W), 15 Feb. 1938, at 9.5 fathoms (17.3 m), (LACM-AHF 845-38).
- 8) 5 specimens, in alcohol, largest 11.2 mm long (slit formula, 9-1-8), Isla Lobos de Afuera, Peru (6°57'S; 80°42'W), leg. J. H. McLean, Jan. 1974 (LACM 74-6).

**Distribution:** *Calloplax hanselmani* seems to be confined to the tropical eastern Pacific with a geographic range extending between 23° 13' N and 6° 57' S, and bathymetric range from 0 to 17 m.

**Individual Variation:** Among the 35 specimens of *Calloplax hanselmani* examined (including type material) there was relatively little variation. In color, dark green predominates but a few specimens are brighter brown to cream; one specimen shows white in two of the intermediate valves, another red at the jugum. Larger specimens with more numerous pustules on lateral areas and end valves, and more convex postmucro. Largest specimen examined, 16.2 mm long. Slit formulae, 8/9-1-9. No essential differences were found between Galápagos and mainland specimens.

**Remarks:** The small size of the specimens of *Calloplax hanselmani* collected in the Galápagos Islands suggested at first that they might be juveniles of some unrecognized species in the genus *Chaetopleura* Shuttleworth, 1853 (SMITH & FERREIRA, 1977). The finding of conspecific populations along the coast of Mexico and Peru permitted the recognition of a new species and its assignment to the genus *Calloplax*, instead.

The taxonomic position of *Calloplax* has remained uncertain. Erected by THIELE (1909) to accommodate *Chiton janeirensis* (therefore assigned to *Chaetopleura*), *Calloplax* was allocated to Chaetopleuridae in early works (THIELE, 1929; BERGENHAYN, 1930; SMITH, 1960), to Callistoplacidae more recently (SMITH & FERREIRA, 1977; VAN BELLE, 1978; FERREIRA, 1978). The question hinges on the assessment of the similarities between *Calloplax* and *Chaetopleura* on the one side and *Callistochiton* on the other. *Calloplax* resembles *Callistochiton* in the 1) elongated shape; 2) general characteristics of the valves with their strong tegmental sculpture of radial ribs on end valves and lateral areas of intermediate valves; 3) correspondence between articulation slits and tegmental ribs; and 4) tendency towards an upswept vii valve. It approaches *Chaetopleura* in the 1) pustulose tegmental sculpture; 2) girdle upper surface elements of relatively undifferentiated small scales interspersed with glassy spicules, and under surface rectangular scales; and 3) radula with wide, sub-quadrangular median tooth and tricuspid major lateral teeth. The relative merits of these similarities indicate that *Calloplax* is phylogenetically closer to *Chaetopleura* than to *Callistochiton* and, therefore, that its allocation to Chaetopleuridae is amply justified.

Integumental sculpture and girdle elements, *C. hanselmani* is definitely distinct from the two other congeneric species in the eastern Pacific, *C. vivipara* and *C. duncana* (see FERREIRA, 1978). However, it bears notable resemblance to the Caribbean *C. janeirensis* particularly in the strongly pustular sculpture of the end valves and lateral areas of the intermediate valves, and in the ovoid, coarsely striated girdle scales. The similarities between *C. hanselmani* and *C. janeirensis* are such as to suggest that the two species might have separated at relatively recent geologic times, perhaps in the Mid-Pliocene at the emergence of the Panamanian barrier. Based on the specimens examined, *C.*

*hanselmani* is seen to differ from *C. janeirensis* in the 1) much smaller size, 2) less prominent tegmental sculpture, and 3) empty girdle bridges.

The species is here called *hanselmani* after a good friend, Col. George A. Hanselman, San Diego, California, enthusiastic chiton collector, who has made many valuable contributions, both in specimens and ideas, to this and other works.

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### Explanation of Figures 1 to 3 and 7, 8

Figure 1: *Calloplax hanselmani* Ferreira, spec. nov. Holotype. Disarticulated valves.

Figure 2: *Calloplax hanselmani* Ferreira, spec. nov. Holotype. Tegmental surface of valves i, iv, and viii.

Figure 3: *Calloplax hanselmani* Ferreira, spec. nov. Holotype. Articulament surface of valves i, iv, and viii.

Figure 7: *Calloplax hanselmani* Ferreira, spec. nov. Paratype, 6.7 mm long (CAS 017707).

Figure 8: *Calloplax hanselmani* Ferreira, spec. nov. Specimens 8.2, 7.2 and 5.2 mm long, collected at Punta Marinero, Mazatlán, Sinaloa, Mexico (G. A. Hanselman Colin.).